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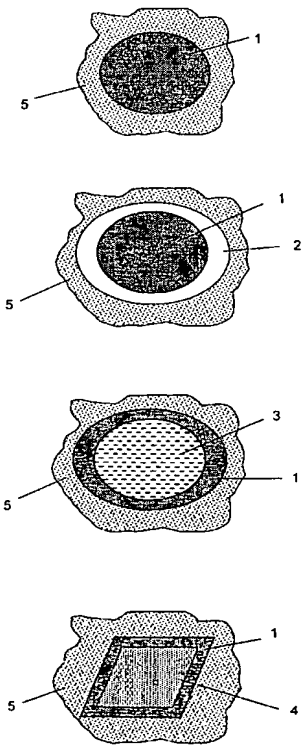
(54) Title: DELIVERY OF NEUTRON CAPTURE ELEMENTS FOR NEUTRON CAPTURE THERAPY



(57) Abstract: Neutron capture therapy (NCT) for example, Boron neutron capture therapy (BNCT) requires the delivery of a neutron capture element such as Boron to a target site to be treated, followed by irradiation with neutrons. The invention provides new means for delivery of the neutron capture element in the form of insoluble inorganic nanoparticles having a particle size of about 10^{-10}m to about 10^{-6}m. The neutron capture element can be in particulate form or in the form of glass or glass ceramic or as a polymerised inorganic matrix or as a sol-gel derived xerogel. The nanoparticles of the invention can further comprise a biocompatible outer layer which provides the function of stealth and assists in providing an appropriate clearance rate. In some embodiments, the nanoparticles comprise a core selected from, for example, mica, zeolites, TiO_2 spheres, ZrO_2 spheres or particles or organic polymer particles or spheres surrounded by a thin film of the neutron capture element. Pharmaceutical compositions, uses and methods for the treatment of cancer are disclosed. Also disclosed is a process for the preparation of water insoluble nanoparticles comprising causing friction between pure blocks of the required neutron capture element in an inorganic form and collecting nanoparticles that result therefrom.

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